Peter Kalmus

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Education

Ph.D. Physics. Columbia University, 2008
Thesis: *Gravitational Waves Associated with Soft Gamma Repeater Flares*

B.A. Physics. Harvard University, cum laude, 1997

Appointments

Assistant Researcher, Climate Physics. University of California, Los Angeles, 2014-present

Postdoctoral Scholar, Climate Physics. California Institute of Technology, 2013-2014

Senior Postdoctoral Scholar, Physics. California Institute of Technology, 2011-2012

Lecturer in Physics. California Institute of Technology, 2012

Postdoctoral Scholar, Physics. California Institute of Technology, 2008-2011

Synergistic Activities

Initiator and Leader, LIGO-Virgo Supernova Working Group 2011–2012.

Leader, LIGO-Virgo Externally Triggered Group 2011–2012.

Collaboration Reviewer, Compact Binary Coalescence Parameter Estimation 2010–2012.

Organizer, LIGO-Virgo Externally Triggered Group telecon external speaker series 2010–2012.

Organizer, Caltech Supernovae GW Search Workshop May 2010.

Principal Publications

Peter Kalmus, Sun Wong, and Joo Teixeira. "The Pacific Subtropical Cloud Transition: A MAGIC Assessment of AIRS and ECMWF Thermodynamic Structure." (2015). Submitted to Geophysical Research Letters.

P. Kalmus, M. Lebsock, and Joo Teixeira. "Observational Boundary Layer Moisture and Energy Budgets of the Marine Stratocumulus-to-Cumulus Transition." (2015). Accepted to Journal of Climate.

J. Abadie *et al.* "Implications for the Origin of GRB 051103 from LIGO Observations." *The Astrophysical Journal* **755**, 2 (2012). URL `http://stacks.iop.org/0004-637X/755/i=1/a=2`.

J. Abadie *et al.* "Search for Gravitational Wave Bursts from Six Magnetars." *ApJ Lett.* **734**, L35 (2011). `1011.4079`, URL `http://stacks.iop.org/2041-8205/734/i=2/a=L35`.

B. P. Abbott *et al.* "Stacked Search for Gravitational Waves from the 2006 SGR 1900+14 Storm." *ApJ Lett.* **701**, L68–L74 (2009). `0905.0005`.

B. Abbott *et al.* "Search for Gravitational-Wave Bursts from Soft Gamma Repeaters." *Phys. Rev. Lett.* **101**, 211102 (pages 6) (2008). URL `http://link.aps.org/abstract/PRL/v101/e211102`.

Other Refereed Publications

C. D. Ott, E. Abdikamalov, E. O'Connor, C. Reisswig, R. Haas, P. Kalmus, S. Drasco, A. Burrows, and E. Schnetter. "Correlated gravitational wave and neutrino signals from general-relativistic rapidly rotating iron core collapse." *Phys. Rev. D* **86**, 024026 (2012). URL `http://link.aps.org/doi/10.1103/PhysRevD.86.024026`.

J. Logue, C. D. Ott, I. S. Heng, P. Kalmus, and J. H. C. Scargill. "Inferring core-collapse supernova physics with gravitational waves." *Phys. Rev. D* **86**, 044023 (2012). URL `http://link.aps.org/doi/10.1103/PhysRevD.86.044023`.

P. J. Sutton, G. Jones, S. Chatterji, P. Kalmus, I. Leonor, S. Poprocki, J. Rollins, A. Searle, L. Stein, M. Tinto, and M. Was. "X-Pipeline: an analysis package for autonomous gravitational-wave burst searches." *New Journal of Physics* **12**, 053034–+ (2010). `0908.3665`.

E. Goetz, P. Kalmus, S. Erickson, R. L. Savage, Jr., G. Gonzalez, K. Kawabe, M. Landry, S. Marka, B. O'Reilly, K. Riles, D. Sigg, and P. Willems. "Precise calibration of LIGO test mass actuators using photon radiation pressure." *Classical and Quantum Gravity* **26**, 245011–+ (2009). `0910.5591`.

E. Goetz, R. L. Savage, Jr., J. Garofoli, G. Gonzalez, E. Hirose, P. Kalmus, K. Kawabe, J. Kissel, M. Landry, B. O'Reilly, X. Siemens, A. Stuver, and M. Sung. "Accurate calibration of test mass displacement in the LIGO interferometers." *ArXiv e-prints* (2009). `0911.0853`.

Yoichi Aso, Evan Goetz, Peter Kalmus, Luca Matone, Szabolcs Marka, Joshua Myers, Brian O'Reilly, Rick Savage, Paul Schwinberg, Xavier Siemens, Daniel Sigg, and Nicolas Smith. "Accurate measurement of the time delay in the response of the LIGO gravitational wave detectors." *Classical and Quantum Gravity* **26**, 055010 (13pp) (2009). URL `http://stacks.iop.org/0264-9381/26/055010`.

P. Kalmus, K. C. Cannon, S. Márka, and B. J. Owen. "Stacking gravitational wave signals from soft gamma repeater bursts." *Phys. Rev. D* **80**, 042001–+ (2009). `0904.4906`.

B. Abbott *et al.* "Implications for the Origin of GRB 070201 from LIGO Observations." *ApJ* **681**, 1419–1430 (2008).

B. Abbott *et al.* (LIGO Scientific Collaboration). "Search for gravitational waves associated with 39 gamma-ray bursts using data from the second, third, and fourth LIGO runs." *Phys. Rev. D* **77**, 062004 (pages 22) (2008). URL `http://link.aps.org/abstract/PRD/v77/e062004`.

P. Kalmus, R. Khan, L. Matone, and S. Márka. "Search method for unmodeled transient gravitational waves associated with SGR flares." *Classical and Quantum Gravity* **24**, 659–+ (2007).

B. Abbott *et al.* (LIGO Scientific Collaboration). "Search for gravitational wave radiation associated with the pulsating tail of the SGR 1806–20 hyperflare of 27 December 2004 using LIGO." *Phys. Rev. D* **76**, 062003 (2007). `astro-ph/0703419`.

L. Matone, P. Raffai, S. Marka, R. Grossman, P. Kalmus, Z. Marka, J. Rollins, and V. Sannibale. "Benefits of Artificially Generated Gravity Gradients for Interferometric Gravitational-Wave Detectors." *ArXiv General Relativity and Quantum Cosmology e-prints* (2007). `http://arxiv.org/abs/gr-qc/0701134`.

M. Lightman, J Thurakal, J Dwyer, R Grossman, P Kalmus, L Matone, J Rollins, S Zairis, and S Márka. "Prospects of gravitational wave data mining and exploration via evolutionary computing." *Journal of Physics: Conference Series* **32**, 58–65 (2006). `http://stacks.iop.org/1742-6596/32/58`.

M. C. McCarthy, M. J. Travers, P. Kalmus, C. A. Gottlieb, and P. Thaddeus. "Microwave Spectroscopy of the Carbon Chain Radical C11H." *Chemical Physics Letters* **264**, 252–+ (1997).

M. J. Travers, M. C. McCarthy, P. Kalmus, C. A. Gottlieb, and P. Thaddeus. "Laboratory Detection of the Cyanopolyyne HC 13N." *ApJ Lett.* **472**, L61+ (1996).

M. J. Travers, M. C. McCarthy, P. Kalmus, C. A. Gottlieb, and P. Thaddeus. "Laboratory Detection of the Linear Cyanopolyyne HC11N." *ApJ Lett.* **469**, L65+ (1996).

M. C. McCarthy, M. J. Travers, P. Kalmus, C. A. Gottlieb, and P. Thaddeus. "Laboratory Detection of the C9H Radical." *ApJ Lett.* **467**, L125+ (1996).

Refereed Collaboration Papers

J. Abadie *et al.* "A gravitational wave observatory operating beyond the quantum shot-noise limit." *Nat Phys* (2011). Advance online publication, URL `http://dx.doi.org/10.1038/nphys2083`.

J. Abadie *et al.* "Beating the Spin-down Limit on Gravitational Wave Emission from the Vela Pulsar." *ApJ* **737**, 93–+ (2011). `1104.2712`.

B. P. Abbott *et al.* "Directional limits on persistent gravitational waves using LIGO S5 science data." *ArXiv e-prints* (2011). `1109.1809`.

The LIGO Scientific Collaboration, Virgo Collaboration: J. Abadie, *et al.* "Implementation and testing of the first prompt search for electromagnetic counterparts to gravitational wave transients." *ArXiv e-prints* (2011). `1109.3498`.

J. Abadie *et al.* (LIGO Scientific Collaboration and Virgo Collaboration). "Search for gravitational waves from binary black hole inspiral, merger, and ringdown." *Phys. Rev. D* **83**, 122005 (2011). URL `http://link.aps.org/doi/10.1103/PhysRevD.83.122005`.

J. others Abadie. "All-sky Search for Periodic Gravitational Waves in the Full S5 LIGO Data." *ArXiv e-prints* (2011). `1110.0208`.

B. P. Abbott *et al.* "First LIGO search for gravitational wave bursts from cosmic (super)strings." *Phys. Rev. D* **80**, 062002–+ (2009). `0904.4718`.

LIGO Scientific Collaboration, Virgo Collaboration: J. Abadie, *et al.* "Search for gravitational-wave inspiral signals associated with short Gamma-Ray Bursts during LIGO's fifth and Virgo's first science run." *ArXiv e-prints* (2010). `1001.0165`.

B. P. Abbott *et al.* "Search for gravitational wave ringdowns from perturbed black holes in LIGO S4 data." *Phys. Rev. D* **80**, 062001–+ (2009). `0905.1654`.

The LIGO Scientific Collaboration, The Virgo Collaboration: B. P. Abbott, *et al.* "Searches for gravitational waves from known pulsars with S5 LIGO data." *ArXiv e-prints* (2009). `0909.3583`.

B. P. Abbott *et al.* "Search for gravitational waves from low mass compact binary coalescence in 186 days of LIGO's fifth science run." *Phys. Rev. D* **80**, 047101–+ (2009). `0905.3710`.

B. P. Abbott *et al.* "Einstein@Home search for periodic gravitational waves in early S5 LIGO data." *Phys. Rev. D* **80**, 042003–+ (2009). `0905.1705`.

B. P. Abbott *et al.* "An upper limit on the stochastic gravitational-wave background of cosmological origin." *Nature* **460**, 990–994 (2009). `0910.5772`.

B. P. Abbott *et al.* "Search for gravitational-wave bursts associated with gamma-ray bursts using data from LIGO Science Run 5 and Virgo Science Run 1." *ArXiv e-prints* (2009). `0908.3824`.

B. Abbott *et al.* "Observation of a kilogram-scale oscillator near its quantum ground state." *New Journal of Physics* **11**, 073032–+ (2009).

B. Abbott *et al.* (LIGO Scientific Collaboration). "Upper limits on gravitational wave emission from 78 radio pulsars." *Phys. Rev. D* **76**, 042001 (pages 20) (2007). URL `http://link.aps.org/abstract/PRD/v76/e042001`.

B. Abbott *et al.* (LIGO Scientific Collaboration and ALLEGRO Collaboration). "First cross-correlation analysis of interferometric and resonant-bar gravitational-wave data for stochastic backgrounds." *Phys. Rev. D* **76**, 022001 (pages 17) (2007). URL `http://link.aps.org/abstract/PRD/v76/e022001`.

B. Abbott *et al.* (LIGO Scientific Collaboration). "Searching for a Stochastic Background of Gravitational Waves with the Laser Interferometer Gravitational-Wave Observatory." *The Astrophysical Journal* **659**, 918–930 (2007). `http://www.journals.uchicago.edu/doi/pdf/10.1086/511329`, URL `http://www.journals.uchicago.edu/doi/abs/10.1086/511329`.

B. P. Abbott *et al.* "Search for gravitational waves from low mass binary coalescences in the first year of LIGO's S5 data." *Phys. Rev. D* **79**, 122001–+ (2009). `0901.0302`.

B. Abbott *et al.* (LIGO Scientific Collaboration). "All-Sky LIGO Search for Periodic Gravitational Waves in the Early Fifth-Science-Run Data." *Physical Review Letters* **102**, 111102–+ (2009). `0810.0283`.

B. Abbott *et al.* (LIGO Scientific Collaboration). "Einstein@Home search for periodic gravitational waves in LIGO S4 data." *Phys. Rev. D* **79**, 022001–+ (2009). `0804.1747`.

B. Abbott *et al.* "First joint search for gravitational-wave bursts in LIGO and GEO 600 data." *Classical and Quantum Gravity* **25**, 245008–+ (2008). `0807.2834`.

B. Abbott *et al.* (LIGO Scientific). "Astrophysically Triggered Searches for Gravitational Waves: Status and Prospects." *Class. Quant. Grav.* **25**, 114051 (2008). `0802.4320`.

B. Abbott *et al.* "A joint search for gravitational wave bursts with AURIGA and LIGO." *Class. Quant. Grav.* **25**, 095004 (16pp) (2008). URL `http://stacks.iop.org/0264-9381/25/095004`.

B. Abbott *et al.* "Search of S3 LIGO data for gravitational wave signals from spinning black hole and neutron star binary inspirals." *Phys. Rev. D* **78**, 042002–+ (2008). `0712.2050`.

B. Abbott *et al.* "Beating the Spin-Down Limit on Gravitational Wave Emission from the Crab Pulsar." *ApJ Lett.* **683**, L45–L49 (2008). `0805.4758`.

B. P. Abbott, R. Abbott, R. Adhikari, P. Ajith, B. Allen, G. Allen, R. S. Amin, S. B. Anderson, W. G. Anderson, M. A. Arain, and et al. "LIGO: the Laser Interferometer Gravitational-Wave Observatory." *Reports on Progress in Physics* **72**, 076901–+ (2009). `0711.3041`.

B. Abbott *et al.* (LIGO Scientific Collaboration). "Search for gravitational waves from binary inspirals in S3 and S4 LIGO data." *Phys. Rev. D* **77**, 062002 (pages 13) (2008). URL `http://link.aps.org/abstract/PRD/v77/e062002`.

B. Abbott *et al.* (LIGO Scientific Collaboration). "All-sky search for periodic gravitational waves in LIGO S4 data." *Phys. Rev. D* **77**, 022001 (pages 38) (2008). URL `http://link.aps.org/abstract/PRD/v77/e022001`.

B. Abbott *et al.* (LIGO Scientific Collaboration). "Search for gravitational-wave bursts in LIGO data from the fourth science run." *Class. Quant. Grav.* **24**, 5343–5369 (2007). URL `http://stacks.iop.org/0264-9381/24/5343`.

B. Abbott *et al.* (LIGO Scientific Collaboration). "Upper limit map of a background of gravitational waves." *Phys. Rev. D* **76**, 082003 (pages 11) (2007). URL `http://link.aps.org/abstract/PRD/v76/e082003`.

B. Abbott *et al.* (LIGO Scientific Collaboration). "Searches for periodic gravitational waves from unknown isolated sources and Scorpius X-1: Results from the second LIGO science run." *Phys. Rev. D* **76**, 082001 (pages 35) (2007). URL `http://link.aps.org/abstract/PRD/v76/e082001`.

Selected Invited Talks and Panels

AIRS Science Team Meeting. Caltech, 2014.
Talk: "Observational Boundary Layer Energy and Water Budgets of the Marine Stratocumulus-to-Cumulus Transition."

Nuclear Astrophysics Town Meeting. Detroit, MI, October 2012.
Talk: "Multi-messenger Signatures of Core-Collapse Supernovae."

Max Planck Institute for Gravitational Physics. Hannover, Germany, July 2010.
Talk: "Magnetars, Supernovae, and GEO'.'

Gravitational Wave Bursts. Chichen-Itza, Mexico, December 2009.
Panels: "Isolated NS and other sources," "Data Analysis."

Caltech/JPL Association for Gravitational Wave Research (CaJAGWR). Caltech, November 2009.
Talk: "GW Detector Calibration."

12th Marcel Grossmann Meeting. Paris, France, July 2009.
Talk: "Gravitational Waves from Magnetars."

Probing Neutron Stars with Gravitational Waves. State College, PA, June 2009.
Talk: "Searching for Gravitational Waves from Soft Gamma Repeaters."

LIGO Caltech Seminar. Caltech, July 2008.
Talk: " S5y1 SGR Burst Search."

Teaching and Outreach Experience

Lecturer in Physics. California Institute of Technology, 2012
Taught one semester of special relativity and electromagnetism to first-year undergraduates.

Research Mentoring. 2007–2012
Mentored 11 undergraduates, graduate students, and postdocs in research projects.

Columbia Science Honors Program: "Gravitation." Columbia University, Fall 2006.
Designed a course for gifted high school students which surveyed gravitation and introduced general relativity, computer simulation, and research in LIGO.

Preceptor for General Physics Labs. Columbia University, Fall 2005–Spring 2006.
Responsible for training ∼30 graduate student TAs and facilitating the lab courses.

Teaching Assistant. Columbia University, Fall 2004–Fall 2007.
General physics lab (2004–2005); advanced undergraduate lab (2006–2007).

Physics Teacher. Tabor Academy, Marion, MA, 1998–2000.
Responsible for curriculum and instruction in Physics, Astronomy, Algebra and Precalculus. Coached JV men's crew, sailing. Responsible for Tabor's rooftop observatory.